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EXAMINER
SWERDLOW, DANIEL

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/819,158	Applicant(s) NORRELL ET AL.	
	Examiner Daniel Swerdlow	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 16 and 18 through 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Quarles (U. S. Patent 1,711,653).

3. Claim 1 claims a load coil comprising a coupled inductor with two windings wrapped about an inductor core with a first capacitive element between the input of the first winding and the output of the second winding and a second capacitive element between the input of the second winding and the output of the first winding. Quarles discloses a load coil comprising a coupled inductor with two windings wrapped about an inductor core with capacitors connected diagonally across the windings (Fig. 1 and page 1, lines 99-102). Claim 1 contains language indicating the inductor is configured to counteract capacitance across the loop to improve transmission of POTS-based signals and that the capacitive elements are configured to permit passage of DSL signals. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham, 2 USPQ2d 1647* (Bd. Pat. App. & Inter. 1987). Because the load coil disclosed

by Quarles is structurally identical to the load coil of Claim 1, the recitation related to use carries no weight. Therefore, Quarles anticipates all elements of Claim 1.

4. Claim 16 claims a load coil comprising inductive means for conditioning POTS signals as they traverse the local loop and capacitive means coupled to the inductive means for permitting DSL signals to pass across the load coil. Quarles discloses a loading system comprising inductive means and capacitive means (Fig. 1 and page 1, lines 99-102). Claim 16 contains language indicating the inductive means conditions POTS signals and that the capacitive means permits passage of DSL signals. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham, 2 USPQ2d 1647* (Bd. Pat. App. & Inter. 1987). Because the loading system disclosed by Quarles is structurally identical to the load coil of Claim 1, the recitation related to use carries no weight. Therefore, Quarles anticipates all elements of Claim 16.

5. Claim 18 claims a method for improving simultaneous transmission of POTS-band and DSL signals across a local loop, comprising the steps of: inductively coupling a first segment of the local loop to a second segment of the local loop to condition the POTS-band signals traversing the local loop; and capacitively coupling a first segment of the local loop to a second segment of the local loop to pass the DSL signals traversing the local loop with low attenuation. Quarles discloses a loading system that inductively couples a first segment of the local loop to a second segment of the local and capacitively couples a first segment of the local loop to a second segment of the local loop (Fig. 1 and page 1, lines 99-102). The recitation of intended use in the

claim carries no weight since the loading system disclosed by Quarles inherently possesses the properties that condition the POTS-band signals traversing the local loop and pass the DSL signals traversing the local loop with low attenuation. Therefore, Quarles anticipates all elements of Claim 18.

6. Claim 19 claims the method of Claim 18 wherein the step of inductively coupling includes coupling a first wire of the first segment of the local loop to a first wire of the second segment of the local loop via a first inductor winding and coupling a second wire of the first segment of the local loop to a second wire of the second segment of the local loop via a second inductor winding. As stated above apropos of Claim 18, Quarles anticipates all elements of that claim. In addition, Quarles discloses coupling a first wire of the first segment of the local loop to a first wire of the second segment of the local loop via a first inductor winding and coupling a second wire of the first segment of the local loop to a second wire of the second segment of the local loop via a second inductor winding (Fig. 1). Therefore, Quarles anticipates all elements of Claim 19.

7. Claim 20 claims the method of Claim 18 wherein the step of capacitively coupling includes coupling a first wire of the first segment of the local loop to a second wire of the second segment of the local loop via a first capacitive element and coupling a second wire of the first segment of the local loop to a first wire of the second segment of the local loop via a second capacitive element. As stated above apropos of Claim 18, Quarles anticipates all elements of that claim. In addition, Quarles discloses coupling a first wire of the first segment of the local loop to a second wire of the second segment of the local loop via a first capacitive element and coupling a second wire of the first segment of the local loop to a first wire of the second segment

of the local loop via a second capacitive element (Fig. 1). Therefore, Quarles anticipates all elements of Claim 20.

8. Claim 21 claims the method of Claim 18 wherein the step of capacitively coupling includes coupling a first wire of the first segment of the local loop to a first wire of the second segment of the local loop via a first capacitive element and coupling a second wire of the first segment of the local loop to a second wire of the second segment of the local loop via a second capacitive element. There is no structural limitation in Claim 20 or Claim 21 that distinguishes the first wire of the second segment from the second wire of the second segment. Therefore, Claim 21 is equivalent to Claim 20 and is rejected for the same reasons as are stated above apropos of Claim 20.

9. Claim 22 claims a system comprising: a first local loop including a first wire and a second wire; a second local loop including a third wire and a fourth wire; a coupled inductor including an inductor core, a first inductive winding coupling the first wire to the third wire and a second inductor winding coupling the second wire to the fourth wire; and capacitive elements including a first capacitor coupling the first wire to the fourth wire and a second capacitor coupling the second wire to the third wire. Quarles discloses a loading system that includes all these elements (Fig. 1). Therefore, Quarles anticipates all elements of Claim 22.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 2, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Federal Telephone and Radio Corporation (Reference Data for Radio Engineers).

12. Claim 2 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 2 with the exception of explicit numerical specification of the capacitance values. Quarles specifies the value of the capacitors as being half of the value to be used between the middle points of the loading coils (page 4, lines 58-64) which is specified to be between .4 and .8 of the total between the wires of one section of the loop. Quarles therefore teaches a value of the capacitors between .2 and .4 of the capacitance of a loop section. Federal Telephone and Radio Corporation teaches that the capacitance of a mile of 24 AWG telephone transmission line is .075 μF (page 111). A 6,000 foot loop section, therefore, has a capacitance of .075(6000/5280) μF which is equal to .085 μF or 85 nF. Hence, the values Quarles teaches are between .2(85)nF and .4(85) nF, that is, between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.

13. Claim 3 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 3 with the exception of explicit numerical specification of the capacitance values. As stated above apropos

of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values of between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention.

14. Claim 5 claims the load coil of Claim 1 wherein the capacitive elements increase the effective interwinding capacitance of the inductor windings by at least a factor of 5. As stated above apropos of Claim 2, the combination of Quarles and Federal Telephone and Radio Corporation teach capacitance values between 17 nF and 34 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective interwinding capacitance by a factor of five to ten (page 13, lines 15-18). Therefore, it is inherent in the values taught by Quarles and Federal Telephone and Radio Corporation that they increase the effective interwinding capacitance of the inductor windings by at least a factor of 5.

15. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Baker (The Challenges of Implementing). Claim 4 claims the load coil of Claim 1 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 1, Quarles discloses all the elements of that claim. Therefore, Quarles discloses all the elements of Claim 4 with the exception of specification of the inductance value. Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading). It would have been obvious to one skilled in the art at the time of the invention to use a load coil with a common inductance value in the system

disclosed by Quarles for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations.

16. Claims 6 through 8, 10 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art.

17. Claim 6 claims a load coil comprising a coupled inductor having first and second windings configured to improve transmission of POTS signals with a capacitor in parallel with each winding to permit passage of DSL signals across the coil with low attenuation. Pupin discloses a load coil comprising a coupled inductor (Fig. 3 and page 3, lines 39-41 and 50-53) configured to improve transmission of telephone signals (page 1, lines 17-19). Therefore, Pupin teaches all elements of Claim 6 with the exception of the capacitor in parallel with each winding to permit passage of DSL signals across the coil with low attenuation. Birck teaches the use of frequency selective elements to allow higher frequency signals to pass across loading coils (Fig. 1C and column 3 line 39 through column 4, line 8). It would have been obvious to one skilled in the art to apply the bypass by a frequency selective element as taught by Birck to the load coil taught by Pupin for the purpose of allowing higher frequency signals to be carried on the loaded line. Therefore, the combination of Pupin and Birck teaches all elements of Claim 6 with the exception of the use of capacitors as the frequency selective element. Examiner takes official notice that it was well known in the art that a capacitor provides a low impedance path for high frequency signals. It would have been obvious to one skilled in the art at the time of the invention to apply the use of capacitors as was well known in the art to the combination of Pupin and Birck for the purpose of providing the frequency selective device.

18. Claim 7 claims the load coil of Claim 6 wherein the first and second capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art teaches all the elements of that claim. Therefore, the combination teaches all the elements of Claim 7 with the exception of the numerical values for the capacitance of the capacitive elements. It would be obvious to one skilled in the art to select values for the capacitive elements such that the magnitude of the impedance of the capacitive elements would be similar to the resistance of a loop section. Since the resistance of a 6,000 foot length of 24 AWG copper wire is 154 ohms, and the lower bound of the ADSL signal band is 26 kHz, an obvious value for the capacitance would be a value, C, such that $1/(2\pi \cdot 26000C)=154\Omega$. This results in a value for C of 40 nF. Therefore, it would have been obvious to one skilled in the art at the time of the invention to utilize capacitors with a value of 40 nF in the combination of Pupin, Birck and well known prior art for the purpose of providing a path for ADSL signals to bypass the load coil inductor with an impedance comparable in magnitude to the resistance of the copper loop section.

19. Claim 8 claims the load coil of Claim 6 wherein the first and second capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art teaches all the elements of that claim. Therefore, the combination teaches all the elements of Claim 8 with the exception of the numerical values for the capacitance of the capacitive elements. As stated above apropos of Claim 7, it would have been obvious to one skilled in the art at the time of the invention to utilize capacitors with a value of 40 nF in Birck's load coil system for the purpose of providing a path

for ADSL signals to bypass the load coil inductor with an impedance comparable to that of the copper loop section.

20. Claim 10 claims the load coil of Claim 6 wherein the capacitive elements increase the effective intrawinding capacitance of the inductor windings by at least a factor of 120. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art teaches all the elements of that claim. In addition, as stated above apropos of Claim 8, the combination teaches a capacitance value of 40 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective intrawinding capacitance by a factor of 100 to 1000 (page 14, lines 16-21). Therefore, it is inherent in the value taught by the combination that it increases the effective intrawinding capacitance of the inductor windings by at least a factor of 120.

21. Claim 23 claims a system comprising: a first local loop including a first wire and a second wire; a second local loop including a third wire and a fourth wire; a coupled inductor including an inductor core, a first inductive winding coupling the first wire to the third wire and a second inductor winding coupling the second wire to the fourth wire; and capacitive elements including a first capacitor coupling the first wire to the third wire and a second capacitor coupling the second wire to the fourth wire. Claim 23 is essentially similar to Claim 6 and is rejected for the reasons stated above apropos of Claim 6.

22. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art as applied to Claim 6 above, and further in view of Baker. Claim 9 claims the load coil of Claim 6 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 6, the combination of Pupin,

Birck and well known prior art discloses all the elements of that claim. Therefore, the combination discloses all the elements of Claim 9 with the exception of specification of the inductance value. Baker discloses that 66 mH is one of the two most commonly used values for inductors used as loading coils in analog telephone systems (page 2, second heading). It would have been obvious to one skilled in the art at the time of the invention to apply the common inductance value of 66 mH to the combination taught by Pupin, Birck and well known prior art for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations.

23. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of Vittore (Making DSL Go for the Long Run). Claim 17 claims a system for transmitting DSL and POTS signals comprising a load coil means including inductive means and capacitive means for improving DSL transmission across the load coil and DSL amplification means to amplify DSL signals. As stated above apropos of Claim 1, Quarles teaches all the elements of the load coil means. Therefore, Quarles teaches all elements of Claim 17 with the exception of DSL amplification means. Vittore discloses a DSL repeater that amplifies DSL signals (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the DSL amplifier disclosed by Vittore on a loop in addition to the load coil system taught by Quarles for the purpose of providing DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3).

24. Claims 11 and 13 through 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore.

25. Claim 11 claims a system for transmitting DSL and POTS signals comprising a load coil including a coupled inductor and multiple capacitive elements for improving DSL transmission across the coil and a repeater which includes another load coil in series with the load coil to amplify DSL signals. As stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art teaches all the elements of the first load coil. Vittore discloses a DSL repeater that is selective of DSL signals and amplifies only them (paragraph 11). It would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective DSL amplifier disclosed by Vittore in the combination of Pupin, Birck and well known prior art for the purpose of providing the frequency selective element disclosed by Birck. Further, it would have been obvious to one skilled in the art at the time of the invention to utilize the frequency selective amplifier and load coil combination on a loop in addition to the capacitor and load coil combination for the purpose of providing DSL service on loops in excess of 18,000 feet long (Vittore, paragraph 3).

26. Claim 13 claims the system of Claim 11 with first and second windings and capacitive elements disposed in parallel with those windings. As stated above apropos of Claim 11, the combination of Pupin, Birck, well known prior art and Vittore meets all elements of that claim. Further, as stated above apropos of Claim 6, the combination of Pupin, Birck and well known prior art meets all the additional elements of Claim 13. Therefore the combination of Pupin, Birck, well known prior art and Vittore meets all elements of Claim 13.

27. Claim 14 claims the system of Claim 11 wherein each capacitive element has a capacitance between 10 nF-82 nF. As stated above apropos of Claim 11, the combination of Pupin, Birck, well known prior art and Vittore have all the elements of that claim. Further, as stated above apropos of Claim 7, the combination of Pupin, Birck and well known prior art teaches the use of a value of 40 nF for the capacitive elements. Therefore the combination of Pupin, Birck, well known prior art and Vittore meets all elements of Claim 14.

28. Claim 15 claims the system of Claim 11 wherein each capacitive element has a capacitance between 5 nF-50 nF. As stated above apropos of Claim 11, the combination of Pupin, Birck, well known prior art and Vittore have all the elements of that claim. Further, as stated above apropos of Claim 7, the combination of Pupin, Birck and well known prior art teaches the use of a value of 40 nF for the capacitive elements. Therefore the combination of Pupin, Birck, well known prior art and Vittore meets all elements of Claim 15.

29. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pupin in view of Birck and further in view of well known prior art and further in view of Vittore as applied to Claim 11 above, and further in view of Quarles. Claim 12 claims the system of Claim 11 with first and seconds windings capacitive elements disposed diagonally across those windings. As stated above apropos of Claim 11, the combination of Pupin, Birck, well known prior art and Vittore meet all elements of that claim. Therefore the combination has all the elements of Claim 12 with the exception of the diagonal disposal of the capacitive elements. As stated above apropos of Claim 1, Quarles teaches diagonal disposal of capacitors in a loading coil. It would have been obvious to one skilled in the art at the time of the invention to apply the diagonal

disposal of capacitors taught by Quarles to the combination for the purpose of reducing transient distortion.

Response to Arguments

30. Applicant's arguments filed July 2, 2002 have been fully considered but they are not persuasive.

31. Regarding Claim 1, Applicant alleges that the intended use of the load coil makes it patentably distinct from the loading system disclosed by Quarles. Examiner respectfully disagrees. The system disclosed by Quarles is structurally identical to the coil of Claim 1. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham, 2 USPQ2d 1647* (Bd. Pat. App. & Inter. 1987).

32. Applicant's arguments regarding Claims 2, 3, 4 and 5 are based on the allegation regarding Claim 1, addressed above.

33. Regarding Claim 5, Applicant alleges that a teaching of the use of capacitances in the range of 17 nF to 34 nF does not make obvious the quintupling of effective interwinding capacitance. Examiner respectfully disagrees. The obviousness of using a 17 nF capacitance in conjunction with the physical fact stated by Applicant in the disclosure (page 13, lines 15-18) that a capacitance of this value will have the quintupling effect shows that the quintupling effect is obvious since the device that produces the effect is obvious.

34. Applicant's arguments with respect to Claims 6 through 17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on 703-305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

ds
August 12, 2002

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